

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Claim 8 was amended to recite an average maximum roughness (R_z) of from 1.3 to 2.5 μm as indicated in the examples.

Claims 8-10 and 13 were rejected under 35 U.S.C. §103(a) as allegedly obvious over Hansen in view of Clifford. Claims 11-12 were rejected as allegedly obvious in view of Hansen and Clifford further in view of Bittner. Claim 14 was rejected as allegedly obvious over Hansen and Clifford further in view of Oei. Claims 15 and 16 were rejected as allegedly obvious over Hansen, Clifford and Shaw. Applicants respectfully traverse each of these rejections.

Applicants reiterate the previous arguments, some of which are represented here. Clifford mentions nitroguanidine as one of the possible accelerators with an optimum concentration of 0.2% = 2 g/L (table). Clifford is directed to phosphate coatings as conversion coatings prior to coating with a paint (first paragraphs). In contrast, the presently claimed invention is directed in part to the object of optimizing the sliding friction, e.g., for cold-forming of metallic parts. It is noted that nitroguanidine has a quite different behavior than the other nitro compounds that should behave as oxidizing agents and accelerators.

The suggested combination of Clifford and Hansen does not disclose the effect nor make it obvious that nitroguanidine allows the control of both the Fe^{2+} content in the bath solution and the roughness of the phosphate coating.

Generally, as seen from the example/comparison example of the present specification, the roughness index R_z is significantly reduced in the presence of nitroguanidine, although the coating thickness and the coating weight are nearly the same. The effect of the nitroguanidine is indicated by the time of outgassing that shows the time of chemical reaction in the acidic solution which pickles the iron rich surface and generates a higher content of Fe^{2+} so that the metallic surface seems to be passivated by the nitroguanidine and the chemical reactions seem to be hindered by nitroguanidine. Therefore, in the presence of nitroguanidine, there is a longer

time of generating the coating which is favorable for the properties of the coating as there will occur much more crystal nuclei that may grow and cause a finer particle size. Therefore, nitroguanidine is not to be seen as an accelerator or as an oxidation agent, but as a passivation agent to reduce and control the chemical reaction in the bath at and near the metallic surface. Nitrate is added as an accelerator. The content of Fe^{2+} is correlated to the amount of sludge generated which should be reduced. This leads a higher accuracy of the thickness of such coatings which positively influences processes that need very narrow tolerances for the metallic parts that are used and for their further production steps. In former time it was only known to reduce the mean particle size by minimizing the coating thickness whereby the corrosion resistance was also significantly minimized.

Attached is a Rule 132 declaration of Klaus-Dieter Nittel which provides data that the coating according to Example 1 of Clifford does not provide a suitable coating, and does not provide a composition with the claimed S value. Therefore, Clifford teaches away from the presently claimed invention and cannot be combined with Hansen to arrive at the presently claimed invention.

Shaw teaches phosphate coatings which should provide corrosion resistance and paint adhesion (under paints) or lubricant properties for cold-forming. Accelerators like nitrate and nitroguanidine are mentioned also. Shaw had found that it is favorable to let the oil or oil-like substances remain on the surface if they should occur instead of degreasing the surfaces before phosphating. In Shaw's examples IV, V, VI and VII, which, for arguments sake, are considered to be the closest examples to the presently claimed invention, the baths have an Mn content of either 0.3 or 4% by weight, that means 3 or 40 g/L, but the range is not within that claimed.

Generally, it is well known in the art of phosphating that already small changes of the composition, of the acidity or the process may cause unexpected effects. To limit the increase of Fe^{2+} in the bath, it is necessary to limit the pickling effect on the metallic surface. There is no indication in the cited publications giving an indication how to limit the pickling, expect A) with the "gassing" effect by coatings of non-ionic surfactants in Shaw, col. 3, line 45. But for example V of Shaw containing nitroguanidine, no advantage or difference is to be seen. The

exception B) is the concentration of urea or of amido sulphonic acid in Bittner et al. (col. 2, line 40). Furtheron, the limitation of the picking leads to a lower rate of precipitations and phosphate sludge and may therefore be favorable.

The bath of Hansen et al. shall contain 0 to 30 g/l of Fe^{2+} (col. 2. line 11). There is no indication that it may be favorable to limit the Fe^{2+} content of the bath.

The sliding friction is optimized by limiting the roughness of the coating. There are strong differences in the phosphating if one uses a Mn phosphating compared to, e.g., Zn phosphating or ZnMn phosphating, whereby most of the phosphating is carried out with the cations Zn and Mn with a higher Zn content than Mn content, but both cations being present.

In view of the foregoing, allowance is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in the fees filed to our Deposit Account No. 50-0624 under Order No. NY-CHEMMT-206-US.

Dated: March 22, 2004

Respectfully submitted,

By 

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Registration No.: 39,155

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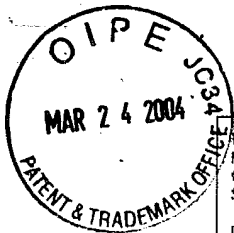
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I hereby certify that this correspondence is being deposited with the U.S. Postal Service by First Class Mail in an envelope addressed to:
Commissioner for Patents, P.O. Box 1450, Alexandria, VA, 22313-1450 on
September 29, 2003

Dated: September 29, 2003

Signature: _____
(Eileen Sheffield)

Docket No.: NY-CHEMMT-206-US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Klaus-Dieter NITTEL, et al.

Application No.: 10/088,840

Group Art Unit: 1742

Filed: July 2, 2002

Examiner: A. L. Oltnans

For: METHOD FOR APPLYING MANGANESE
PHOSPHATE LAYERS

RULE 132 DECLARATION

Commissioner for Patents
P. O. Box 1450
Alexandria, VA, 22313-1450

RECEIVED
MAY 25 2004
TC 1700

Dear Sir:

DECLARATION UNDER RULE 132

Sir:

1. I am Klaus-Dieter Nittel, a chemist employed by the assignee of the present invention. I have a diplom in chemistry. I am a member of Chemetall GmbH since 1968 and I am working in the field of manganese phosphating since then, too.
2. I am fully familiar with the patent application and I am familiar with the Office Action dated October 28, 2003.
3. I submit this declaration with the accompanying data in view of the Examiner's analysis of the application, particularly the Examiner's 35 U.S.C. § 103(a) rejection of claims 8-10 and 13 as allegedly obvious over Hansen et al. U.S. Patent No. 3,860,455 (Hansen) in view of Clifford et al. U.S. Patent No. 2,375,468 (Clifford), and the rejection of claims 11-12 under the same

statute as allegedly obvious over Hansen, Clifford and Bittner et al. U.S. Patent No. 5,798,425 (the '425 patent). Claim 14 was rejected as allegedly obvious over Hansen, Clifford and U.S. Patent No. 4,824,490 to Oei, and claims 15 and 16 were rejected as allegedly obvious over Hansen, Clifford and U.S. Patent No. 2,987,427 to Shaw.

4. I have reviewed Clifford and, at my direction, I have reviewed Example 1 of Clifford which relates to manganese phosphating, the only relevant and informative example since Example 2 relates to zinc phosphating and example 3 relates to zinc/manganese phosphating.

5. The information provided by Clifford is vague, but based on my review, I conducted an experiment modeled after Example 1 of Clifford. My calculations and tests indicate that the composition of Clifford has the following composition:

46.4 g/L P_2O_5

13.6 g/L Mn

100 points total acid

16.6 points free acid

0.166 S value as a relation of free acid to total acid.

6. The S value of the composition of Clifford is outside the presently claimed range. No nitrate was added. The test was conducted on a steel sheet. To reach an iron (II) content as claimed, there has to be a stronger or longer pickling process that is taught by Clifford.

7. According to Clifford, no coating resulted at room temperature, and there was no or nearly no pickling effect at room temperature.

8. The solution was then heated to 80 degrees Celsius, but there was nearly no coating formed on a steel sheet as before, but the pickling effect was very strong.

9. I added 3 g/l of nitroguanidine to the above solution. At room temperature, there was nearly no coating formed during a contact time of 10 minutes.

10. I heated this solution to 80 degrees Celsius. There was a coating formed during a contact time of 10 minutes. A scanning electron microscope photograph revealed that the coating was not closed and inhomogeneous (photograph 2 in comparison to photograph 1 of a coating according to the present application). Therefore, at the places of unclosed parts of the coating, a strong corrosion may occur. The coating showed extremely coarse phosphate crystals (mostly above 100 μm) and the coated surface was extremely rough. It would cause a very high friction during cold forming. Such a coating is clearly not suitable for any industrial application.

11. The pickling effect was significantly reduced compared to the foregoing heating step without nitroguanidine, apparently because of the passivation effect of nitroguanidine.

12. This indicates that nitroguanidine does not act as a typical accelerator in Clifford's Example 1 composition. There is no disclosure in Clifford that nitroguanidine could limit pickling and limit the increase of iron (II).

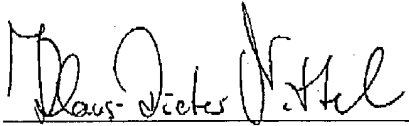
13. It is my opinion that the coating formed in items 9. and 10. above are unsuitable for corrosion protection, and is not suited to a cold forming process.

14. If only the manganese dihydrogen phosphate mentioned in Example 3 of Clifford would be added as phosphate component to the phosphating solution, then there would be no free acid. Therefore, the S value would be about zero or even negative.

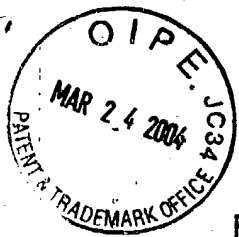
15. It is my opinion that Clifford cannot be combined with Hansen or other references to arrive at the claimed invention.

16. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

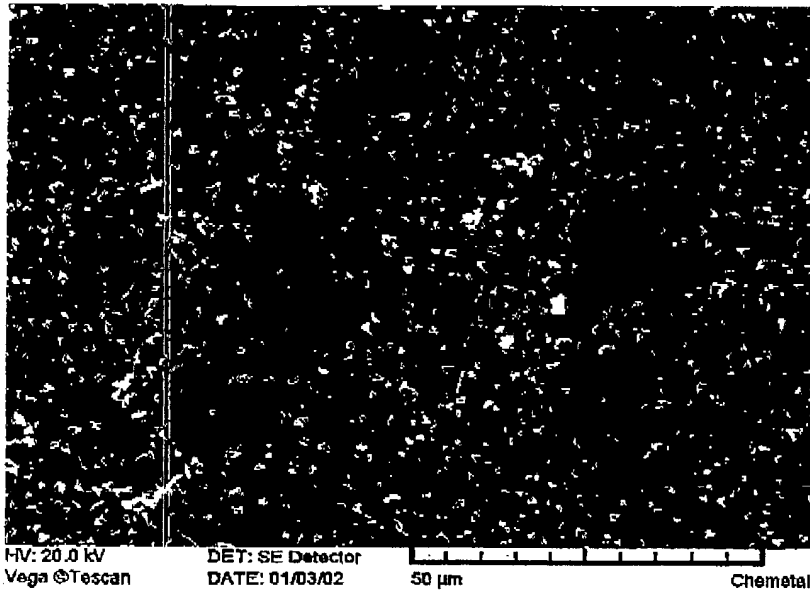
By  Klaus-Dieter V. Hel

Date March, 19th, 2004

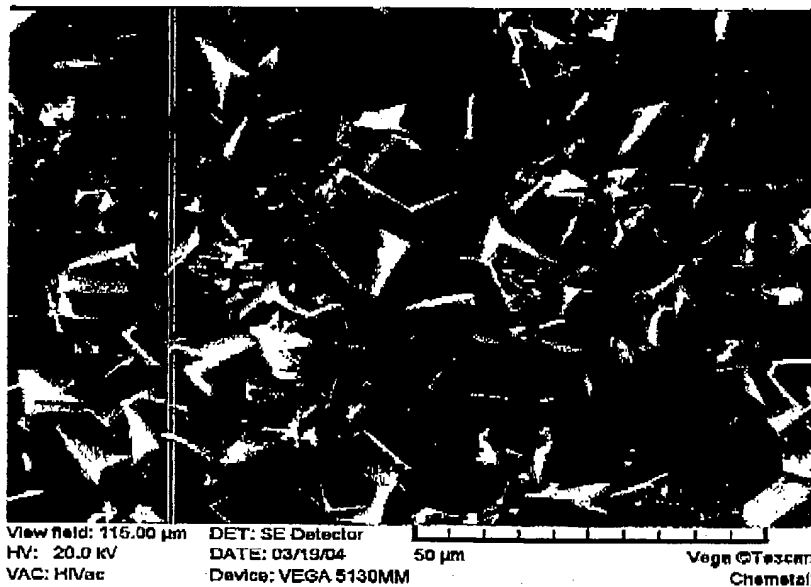


Chemetall

Present Application: GB G4041, Magnification 1000 x



Sample coated according to example 1 of Clifford et al.:
Magnification 1000 x



← not closed coating

